

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION.

## Improvements in or relating to Foot Measuring Instruments.

I, CHARLES FRANCIS BRANNOCK, a Citizen of the United States of America, residing at 703, West Onondaga Street, in the City of Syracuse, State of New York, United States of America, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a foot measuring instrument for accurately measuring either foot to determine accurately the size of the shoe, both as to length and width, best suited for the foot being measured which instrument is particularly simple in construction and easily operated and read by unskilled clerks, whereby not only the size of the shoe best adapted for a particular foot can be readily determined, but also whereby the fitting need not be made by an expert shoe fitter.

Foot measuring devices have been proposed having a base plate, a frame, and a longitudinally movable slide to measure on a fixed scale the position of the joint on the inside of the foot, and a transversely moving slide adapted to be placed against the joint on the outside of the foot, said transversely moving slide having a scale thereon cooperating with a pointer on the frame. Such a construction is suitable for obtaining the dimensions of a foot, but it is one of the objects of the present invention to provide a device which will indicate to the user the type or shape of the foot measured, as well as the dimensions thereof, without the necessity of the exercise of any judgment on the user's part.

According to the invention the foot measuring device comprises a base plate having a heel abutment, a scale on said base plate for indicating the total length of the foot, a ball joint abutment operating in conjunction with a second scale for indicating the length of the foot from heel to ball joint, the said scales being so calibrated that for what may be termed a perfect foot the readings taken on the aforesaid two scales bear a relation to one another, and a width indicating member

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operating in conjunction with a third scale calibrated in correlation with said first and second scales, the said width indicating member bearing a fourth scale which, when the said member is set to a reading on the third scale bearing a relation to the readings on the two first mentioned scales indicate the relative width of the foot, substantially as described.

In order that the invention may be fully understood and readily carried into effect the same will now be described with reference to the accompanying drawings, in which:

Figure 1 is a plan view of the foot measuring instrument;

Figure 2 is an inner face view of the ball joint abutment; and

Figure 3 is a sectional view on line 3—3, Figure 1.

This instrument is here shown as adapted to measure both the right and the left feet, but may be of single construction so that two instruments one used for the left foot and the other for the right foot may be employed.

1 designates the base plate which may be of any suitable form, size and construction and formed of any suitable material, it having heel abutments 2 and 3 at its opposite ends for the right and left foot respectively.

4 designates the scale for indicating the length of the right foot when against the abutment 2; and 5 is a similar scale for reading the length of the left foot when the heel is against the abutment 3.

These scales are so arranged as to be read by the shoe fitter when sitting in front of, and facing, the person whose foot is being measured. Therefore, the scales 4 and 5 in order to be so readable are reversely arranged relatively to each other.

6 designates the ball joint abutment for coacting with the ball joint, and as this instrument is here shown as double, this abutment 6 is located midway between the heel abutments 2, 3. The abutment 6 is also adjustable along scales 7 and 8 for the right and left foot respectively. These scales correspond to the scales 4 and 5 and are reversely arranged relatively to each

other so as to be readable by the shoe fitter when sitting in front of the person whose feet are being measured. The scales are so calibrated that for what may be termed a perfect foot, the reading by the abutment 6 should be the same as that indicated as the length of the foot along the scale 4 or 5; for instance, a foot measuring 10 along the scale 4 should measure 10 along the scale 7. However, this very seldom happens and when the shoe fitter adjusts the abutment 6 to the ball joint and it indicates along the scale 7 or 8 some length other than that indicated on the scale 4 or 5, the difference between the indications gives to the shoe fitter some information on which to determine the proper length of shoe. The ball joint abutment 6 is here shown as adjustable lengthwise of the plate 1 along a slot 6<sup>a</sup>.

The ball joint abutment 6 is formed with a concave pocket 9 for receiving the ball joint of the foot, and the means to aid in finding the exact centre of the joint consists of an upward projection 10 arranged with its engaging face 11 in line with the deepest portion of the concave pocket 9 to engage with the bony structure of the foot at the end of the first metatarsal bone M and a second upward projection 12 higher from the former projection 10 and spaced apart therefrom with its engaging face 13 in line with or flush with the concave wall of the pocket, this projection 12 being located to come opposite the articulation point between the first proximal phalange bone P and the first metatarsal bone M. The edges of these projections converge at 14 toward each other and it will be understood that their engaging faces are in vertical alignment with the concave bottom of the pocket.

The ball joint abutment 6 is provided with a suitable pointer 15 movable along a graduated scale on the base showing the length of the shoe required when the ball joint abutment 6 has been accurately fitted to the ball joint. As the instrument here shown is for measuring right and left feet, there are two of the higher projections 12 arranged on opposite sides of the shorter projection 10 and there are the scales 7, 8 read in opposite directions.

18 is the adjustable width indicating member slidably mounted in suitable guides 22 in the base plate 1 so as to be movable transversely of the said base plate towards and away from the ball joint abutment 6. The member 18 is provided with width graduations A, B, C, D, AA, A3, etc., indicated by the reference numerals 28, 29, and with markings 27 corresponding to the said width gradua-

tions. The said member 18 is also provided with pointers 25, 26, which move along scales 23, 24 provided on the plate 1. The arrangement is such that when the foot to be measured is placed on the instrument, the heel in one of the heel abutments and the ball joint in contact with the abutment 6, the side of the foot opposite the ball joint lies on the width indicating member 18 and the width of the foot may be calculated by noting the width graduation indicated by the marking 27 with which the edge of the foot comes into alignment. To enable the width of the foot to be calculated the scales 23, 24 are calibrated with relation to the scales 4, 5, and 7, so that when, what may be termed, a perfect foot is measured, the edge of the foot comes into alignment with one of the graduation markings, say A, (which may be termed the normal width graduation), the reading on the scales 23, 24 indicated by the pointers 25, 26 will be the same numerically as the reading on the scales 4, or 5, and 7.

The instrument is utilized in measuring the average foot in the following manner: The foot is placed on the instrument with the heel against one of the abutments, say the abutment 2. The ball joint abutment is fitted to the ball joint and the reading along the ball joint scale 7 is noted. Let this reading be  $7\frac{1}{2}$ . The reading on the scale 4 indicating the length from the heel to the toe is noted, and, due to the correlation of the scales 4 and 7, in a perfect foot the reading should be  $7\frac{1}{2}$ , but usually it will show a different reading, say 8. The operator then sets the width indicating member 18 until the arrows 25, 26 point to  $7\frac{1}{2}$  or  $7\frac{3}{4}$ . The graduation marking tangent to the outermost edge of the foot indicates to the operator the width of the foot relative to the length there of, the graduations A, B, C, etc., informing the operator of the type of the foot which is being measured, that is to say, whether it is broad in proportion to length or unusually narrow, etc., then the operator shifts the width indicating member 18 until the pointer 25 or 26 thereon comes opposite the numeral 8 on the scale 23 or 24 and the width graduation 27 on the said indicating member in line with the outer edge of the foot, indicates the width of the shoe.

If the length measurements from heel to ball joint or from heel to toe are not exactly the same, the shoe fitter can strike an average by which to set the indicating member. However, in shoe fitting, the accurate length to a fraction, from the heel to the ball joint is of greatest importance to accurately determine the size

of the shoe both as to length and width and owing to the projection 10, 12, the length of the foot from heel to ball joint can be accurately found.

5 In fitting feet where the ball joint is small and the articulation point easily found, the shoe fitter places the projection 12 opposite to the articulation point and gives less attention to the projection 10 except that the foot must be placed so that the ball joint fits the pocket in the abutment.

When fitting feet where the ball joint is prominent and hence, the exact position of the articulation point difficult to find, the shoe fitter gives his attention primarily to locating the projection 10 at the end of the ball joint and makes his deduction as to the length of the shoe required from the location of the ball joint abutment 6 as located when the projection 10 is accurately located.

In other words, when fitting some feet, the location of the projection 12 accurately at the articulation point is the primary determining factor and in fitting other feet, the location of the projection 10 at the centre of the ball joint is the primary factor. In other cases, the location of both projections 10 and 12 is of equal importance.

In any case, the location of the projections 10 and 12 are factors considered by the shoe fitter.

35 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

40 1. A foot measuring device comprising a base plate having a heel abutment, a scale on said base plate for indicating the total length of the foot, a ball joint abutment operating in conjunction with a second scale for indicating the length of the foot from heel to ball joint, the said scales being so calibrated that for what may be termed a perfect foot the readings taken on the aforesaid two scales bear a relation to one another, and a width indicating member operating in conjunction with a third scale calibrated in correlation with said first and second scales, the said width indicating member 55 bearing a fourth scale which, when the said member is set to a reading on the

third scale bearing a relation to the readings on the two first mentioned scales, indicate the relative width of the foot, substantially as described.

2. A foot measuring device as in claim 1, wherein the base plate has opposing heel abutments for right and left feet, scales arranged reversely relatively to each heel abutment for indicating the length of the foot together with a ball joint abutment for indicating on similarly arranged scales the length of the foot from heel to ball joint and a width indicating member, substantially as described.

3. A foot measuring device as in claim 1, or 2, wherein the ball joint abutment is formed with a concave pocket for receiving the ball joint of the foot, together with means for ascertaining the articulation point between the first metatarsal and first proximal phalange bones.

4. A foot measuring device as in claim 3, wherein the ball joint abutment is adjustable along the base and is formed with a central upward projection having its engaging face in a vertical line with the deepest part of the bottom wall of the concave pocket, together with upwardly extending projections of greater height than the former and spaced apart from and located on opposite sides of said central projection, the said ball joint abutment being also provided with a pointer substantially as and for the purposes described.

5. A foot measuring device according to the preceding claims, wherein the width indicating member consists of a slide movable transversely towards and away from the ball joint abutment in guides on the base, and an indicating member having width graduations thereon and pointers which move along right and left foot scales correlated with the length scales. 100

6. A foot measuring device having its parts constructed, arranged and adapted to operate substantially as herein described with reference to the accompanying drawings. 105

Dated the 23rd day of July, 1928.  
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[This Drawing is a reproduction of the Original on a reduced scale.]

